U.S. DEPARTMENT OF ENERGY
FEDERAL ENERGY MANAGEMENT PROGRAM
CALL FOR FY2001 DISTRIBUTED ENERGY RESOURCES PROJECTS

The U.S. Department of Energy Federal Energy Management Program (FEMP) has funding available up to $400,000 to support cost-effective Federal projects using Distributed Energy Resources (DER).

FEMP provides technical assistance, financing assistance, education, and outreach to Federal agencies meeting energy efficiency and renewable energy goals set by legislation and Executive Order 13123. Distributed Energy Resources (DER) refers to a variety of relatively small decentralized power-generating technologies (i.e. microturbines, fuel cells, and photovoltaics) that can be combined with energy management and storage systems and located close to the point at which the electricity is consumed. Sizes can range from 1 kw up to 20 megawatts depending on the system. DER offers some unique benefits to Federal customers that are not available from centralized generation.

DER offers Benefits to Federal Facilities

By implementing DER integrated systems, Federal facilities can make a significant contribution toward attaining a sustainable energy future. DER technologies potentially offer Federal agencies the following benefits:

- Potential source of high-reliability power for sensitive facilities when coupled with uninterruptible power supply (UPS) systems;

- Greater predictability of energy costs and reduction in energy and electric demand charges;

- Economic source of energy-efficient thermal energy due to combined heat and power capabilities;

- Cost-effective source of peak demand power;

- Environmental benefits --including cleaner quieter operation and reduced emissions (because the generators often rely on natural gas and\or renewable power);

- Faster response to new power demands because capacity additions can be made more quickly.

In certain circumstances, DER technologies also potentially offer benefits to the overall power grid including:

- Deferral of new transmission and distribution (T&D) capital investments;

- Reduction of T&D electrical line losses;

- Improved power quality and reliability (voltage support, source of reactive power, and power factor correction);

- Optimal use of the existing grid assets - including potential to free up transmission assets for increased wheeling capacity.

It should be understood that the availability of these benefits depends on the specific site and its energy needs, and the particular physical, economic and regulatory situations in which the existing centralized electric grid is operating. Maximizing these benefits and their value often requires the right kind of technical, market and policy expertise.

DER is more than just a mix of generation technologies; it is the full system integration of the generation source and the storage and delivery of that generation. The system might include components such as the generator, the control system, energy storage and interaction with the grid. The generation technology can be any of the following sources, powered by natural gas and or renewable energy (see Attachment 2).

- Microturbines
- Advanced industrial turbines
- Concentrating solar power and solar building systems
- Cooling heat and power systems (CHP)
- Fuel cells
- Geothermal systems
- Hybrid systems (fuel cell-combustion turbine and renewable-fossil systems)
- Natural gas reciprocating engines
- Photovoltaic systems
- Wind energy systems

DER projects can also include the use of remote power control systems to turn off electrical loads as needed, and/or the use of energy storage technologies to smooth out power requirements.

Through this call for projects FEMP is interested in identifying and providing technical assistance to projects at Federal facilities. Technical assistance may consist of screening for project opportunities, feasibility studies, writing procurement specifications, design review, taking performance measurements and\or monitoring existing DER systems. Some of the funds will also be available for DER hardware procurement for Federal sites. Technical Assistance

will be provided by DOE national laboratory employees and subcontractors selected from the best energy and sustainability consultants in the country for selected Federal agency projects. DOE sites are eligible to participate in this call.

If you are interested in requesting assistance from FEMP, please complete and submit the attached application by March 16, 2001.

Selection Criteria

FEMP will use the following set of criteria to select the projects for FY01:

- *Agency support for project* – The agency must demonstrate the success of their project is significant to their agency and there is a team of technical, management, and procurement staff at the facility or within the agency committed to making the project a success.

- *Cost effectiveness and value* – DER projects must be life-cycle cost effective according to 10CFR436 or provide a good value such as an educational demonstration or experimental project. Priority will be given to projects with high efficiency (such as CHP sites). Renewable projects should be life-cycle cost effective or provide other values such as emission and greenhouse gas reductions, load management, emergency power, or demonstration. The value to the FEMP Program must be clearly defined.

- *Agency funding available* – The agency must document there is agency funding available for implementation in the next two years, or establish a plan to finance the project through an Energy Savings Performance Contract or a Utility Energy Service Agreement.

- *Cost Sharing/Project Partners* – To the extent possible, FEMP offers core technical assistance free of charge to Federal agencies. Because of its limited budget, FEMP's technical and financial assistance cannot cover all the requests for services. In many cases, the agencies can cost-share with DOE for its technical and financial assistance needs. In these cases, an Interagency Agreement between the agency and DOE will allow for cost-shared technical assistance. Federal agencies are encouraged to obtain project partners, such as utilities or manufacturers who can provide in-kind services or hardware cost-sharing.

- *Implementation in FY2001* – Priority will be given to projects that can be implemented in FY2001. Documentation that management approvals have been obtained, environmental\utility issues researched and\or permits and approvals obtained can be cited as a basis that the project will be implemented in a timely fashion.

- *Strategic value* - Priority will be given to projects in energy markets that can fully exploit DER benefits.

The applications will be scored based on the criteria listed above. Incomplete or omitted responses to questions will lower the overall application score.

The application form can also be found on the FEMP web site: www.eren.doe.gov/femp.

Schedule for DER Call for Projects

- February 8, 2001: Workshop for federal agencies to educate facility managers on DER technologies. San Jose, CA
- March 16, 2001: Applications due
- April 16, 2001: Applicants notified

Application Process

Complete the application in Attachment 1 and send it to the following address by March 16, 2001.

A. Roxane Drayton
McNeil Technologies, Inc.
6564 Loisdale Court, Suite 800
Springfield, VA 22150
(703) 921-1628 Phone
(703) 921-1610 Fax
rdrayton@mcneiltech.com

Attachment 1

FY 2001
FEMP DER CALL FOR PROJECTS APPLICATION

Federal Agency Name:
Contact Person Name:
Address:

Phone:
Fax:
Email:

Project Name:

Type of Request: DER Equipment Technical Assistance

Type of Technology or Technologies:
___ Microturbines
___ Advanced industrial turbines
___ Concentrating solar power and solar building systems
___ Cooling heat and power systems (CHP)
___ Fuel cells
___ Geothermal systems
___ Hybrid systems
___ Natural gas reciprocating engines
___ Photovoltaic systems
___ Wind energy systems
___ Other: _____

Location of Project (include state): _____

Detailed Description of Project (500 word maximum):

Estimate level of effort needed (days):
Estimate funds needed to purchase equipment (dollars):

Describe the amount of agency cost-sharing for this project:

Describe any project partners and the level of in-kind or cost-share committed:
(Please provide a letter from that partner endorsing the project)

Size of capital project (list size of buildings in square feet and/or value of construction in dollars):

Describe your agency's level of commitment to supporting this particular project:

Is this an agency "showcase" project? If yes, describe:

How will your agency fund or finance this project?

What is the unit cost of the type of energy being displaced by this project?
Electricity: _____
Natural Gas: _____
Propane: _____
Diesel: _____
Gasoline: _____
Other: _____

What is your annual energy cost for the building(s) or facility where the project is proposed?

What is your schedule for project implementation? What approvals\permits have been obtained to date?

What benefits will this DER project provide to your agency?

If you have completed a Life Cycle Cost analysis for this project or you have documented the cost of the measures and proposed savings, please attach the form to your application.

Thank you for your application!

Mail, fax or email this form by March 16, 2001 to:

A. Roxane Drayton
McNeil Technologies, Inc.
6564 Loisdale Court, Suite 800
Springfield, VA 22150
(703) 921-1628 Phone
(703) 921-1610 Fax
rdrayton@mcneiltech.com

Please call Ms. Drayton to confirm receipt of your application.

If you have any questions, feel free to contact Shawn Herrera, U. S. Department of Energy at (202) 586-1511 or shawn.herrera@ee.doe.gov.

Attachment 2

Technology Descriptions

Microturbines

Microturbines are currently available in nominal 30, 45, 75 and 100 kW sizes (larger sizes up to 350 kW are being developed), and individual units can be packaged together to serve larger loads. Microturbines are capable of producing power at 20-30% efficiency (LHV).

Turbines

Combustion turbines range in size about from 600 kW to several hundred megawatts. Combustion turbines can burn a wide range of fuels, are capable of dual-fuel operation and have operating efficiencies in the range of 24-35% (LHV).

Concentrating Solar Power

Concentrating solar power systems use suntracking mirrors to reflect and concentrate sunlight into a receiver where it is converted to high temperature thermal energy. The high temperature heat is then used to drive an engine or electric generator.

Cooling, Heating, and Power (CHP)

Cooling, Heating, and Power, or cogeneration, involves capturing waste heat from power production and putting it to some useful purpose at the customer site. The development of CHP systems has the potential for over 90 percent fuel utilization efficiency in industrial, commercial, and residential applications. CHP combines a "prime mover" systems such as combustion turbines, reciprocating engines, or fuel cells, with waste heat energy equipment for the production of hot water, steam, cooling, mechanical energy, and regeneration of desiccants for humidity control in buildings.

Fuel Cells

Fuel cells convert hydrogen-rich fuels, such as natural gas, into electricity and heat through an extremely quiet and environmentally clean process. Fuel cells generate electricity through an electrochemical process in which the energy stored in the fuel is converted directly to electricity.

Geothermal Systems

Goethermal power plants use the natural heat of the earth's interior to drive a turbine generator and produce electricity. Today, electricity is produced from hydrothermal resources (reservoirs of steam or hot water) in the western U.S. In the future, hot dry rocks, which are far more abundant, could contribute to the nation's portfolio of geothermal resources.

Hybrid Systems
Hybrid systems consist of two or more types of distributed energy technologies. The separate units are integrated into packaged hybrid systems that can provide an improved array of energy services to customers.

Natural Gas Engines/Generator Sets
Engine-driven generator sets use internal combustion engines to drive an electric generator in a single package. Typically, constant duty-cycle engines use spark ignition and burn natural gas as the primary fuel. Biofuels can also be used for fuel in place of petroleum and natural gas. Current engine technology achieves efficiencies in the range of 30-40% [based on the fuel's lower heating value (LHV)].

Photovoltaic Systems
Photovoltaic systems use semiconductor-based cells to directly convert sunlight to electricity. Photovoltaic systems can be used to generate electricity on almost any scale, depending on how many modules are connected together. Costs have been reduced by 50 percent since 1991 and sales have been increasingly steadily, particularly in remote power stations.

Wind Energy Systems
Wind turbines convert the kinetic energy of the wind into electricity. Most wind machines use 2-3 propeller-like blades mounted on a rotor connected to an electric generator that is typically 0.5-1 megawatt in capacity. Wind energy systems are modular and can be clustered in areas with good wind resources to form wind farms of 50-100 megawatts or larger.